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**WHY TAX INCENTIVES DON'T PROMOTE
INVESTMENT IN BRAZIL**

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ABSTRACT

The paper discusses the tax issues contributing to the poor Brazilian investment performance. More precisely, the purpose of this paper is threefold. First, the paper develops an analytical framework illustrating the tax design issues reducing the incentive to invest in Brazil. The standard neo-classical framework is adapted to reflect the major characteristics of the Brazilian tax system leading to distortions in the savings and investment decisions. It allows the computation of the marginal effective tax rates (MERT) on capital. The MERTs measure the size of the distortion introduced by taxes in the Brazilian capital market. Second, the computation of the MERT for various types of investment projects is used to show that the current level of taxation of capital in Brazil is unusually high by international standards, with and without tax incentives. Furthermore, the simulations show that the plethora of tax incentives introduced over time to alleviate that burden have lead to complex, inefficient and largely evaded taxes on capital, yielding little revenue without increasing investment. Third, the paper suggests that a reform of the taxation of capital should be a high priority if a recovery of investment and tax revenue is to be achieved by Brazil.

WHY TAX INCENTIVES DON'T PROMOTE INVESTMENT IN BRAZIL

1. Introduction

According to the 1989 World Development Report, Brazil's investment to GDP ratio is below the average for upper-middle income countries. In 1987, Brazil's investment was below 20% of GDP, while the average for upper-middle income countries was 25%. Simultaneously, Brazil's taxes on capital income yielded roughly 2.4% of GDP in revenue or 12% of the investment volume. This is less than half the average revenue from taxes on capital income in similar countries. ^{1/} The poor revenue performance may be explained by the erosion of the tax base and tax rates due to an unusually large number of tax incentives granted to corporate investors. These programs are widely used and costs annually around 1.5% of GDP in direct federal revenue loss. This represents around 20% of the federal tax revenue. In view of this intensive use of tax incentive, it seems paradoxical that the Brazilian investment performance be so poor. Several factors can explain this apparent paradox. The most obvious one is uncertainty with respect to the directions followed by economic policy in Brazil. A more subtle explanation should assess the actual effectiveness of these tax incentives as policy instruments to promote investment. It may be that even with tax incentives, the Brazilian taxation of capital is too high at the margin. The second explanation is the focus of the paper.

The paper discusses the microeconomic issues underlying the macroeconomic stylized facts. More precisely, the purpose of this paper is threefold. First, the paper develops an analytical framework illustrating the tax design issues reducing the incentive to invest in Brazil. The framework accounts for all the major characteristics of the Brazilian tax system leading to distortions in the capital market. It allows the computation of the marginal effective tax rates (MERT) on capital. The MERT measures the size of the distortion. The simulations show that the current level of taxation of capital in Brazil is unusually high by international standards, with and without tax incentives. Second, the computation of the MERT for various types of investment projects is used to identify the major sources of distortions in the Brazilian taxation of capital. Furthermore, the simulations show why the plethora of tax incentives introduced over time to alleviate that burden have lead to complex, inefficient and largely evaded taxes on capital, yielding little revenue without increasing investment. The simulations are also used to rank the incentives programs in terms of their effectiveness at promoting investment. Third, the paper suggests that a reform of the taxation of capital should be a high priority if a recovery of investment and tax revenue is to be achieved by Brazil.

The paper is organized as follows. Section 2 summarizes the methodology followed to provide a quantitative assessment of the size of the distortion imposed by the major taxes on the capital market. The deterrence effect on investment of the Brazilian tax system is then assessed with and without tax incentives. Section 4 concludes and suggests a directions for a reform of the taxation of capital in Brazil.

^{1/}Brazil's collection from taxes on capital has been improving since the mid-eighties but is still far from the collection of similar countries.

Taxes affecting capital are responsible for various types of distortions. Therefore, the MERT can be computed for various types of investment goods (machinery and building), for various types of industries, and for different financing instruments. Even if these measures are largely indicative, as they do not reflect the general equilibrium effects resulting from the shifting of the tax burden between agents, they provide precious information on the various sources of distortions caused by taxes on capital as well as the major victims and beneficiaries. The four major types of distortions caused by taxes on capital are: (i) the intertemporal distortion, the extent of which is measured by the size of the MERT; (ii) the interindustry distortion, measured by the dispersion of the MERT across sectors; (iii) the interest distortion measured by the dispersion of MERT across assets; and (iv) the financing distortion, measured by the dispersion in MERT across financing instruments. ^{3/}

The importance of the assumptions underlying this methodology needs to be emphasized. The firm is a price taker in all markets and all markets are perfectly competitive. The firm selects its stock of debt to minimize its cost of finance. The firm's financial policy is assumed to be exogenously given. Inflation is not an issue because the relevant components of the tax system are perfectly indexed. The firm maximizes profits by investing until the marginal rate of return on capital is equal to the cost of capital. The cost of capital is a function of depreciation, capital gains, financing costs, and the effective purchasing price of capital, and accounts for the tax provisions affecting the price of capital -- CIT, indirect taxes, depreciation rules, and fiscal incentives. In the computation of the MERT, all projects are assumed to offer savers the same after tax rate of return, s . There are, at least two interpretations to a constant after tax rate of return to savers. The first is that it reflects the conventional closed economy assumption. The second is an open-economy interpretation in which savers have access to the world capital markets with an after tax rate of return of s .

The rest of this section is organized as follows. First the pre-tax rate of return on an investment project is derived from the user cost of capital for a competitive firm in a world without taxes, following the neoclassical model of Hall and Jorgenson (1967, 1969, 1971). Next, the expression is derived for a firm facing all the taxes levied on capital in Brazil. Third, the modelling of tax incentives taking the form of tax holidays is discussed in some details. The fourth section shows the derivation of the post-tax rates of returns to savers. The last sections show how the firm's discount rate needs to be adjusted when taxes need to be accounted for.

2.1 Derivation of the pre-tax rate of return in a tax-free world

The basic intuition of the neoclassical model of investment is that an investment project is worthwhile when the net present value of its revenues exceed its acquisition cost. The costs associated with an investment are usually expressed on a per unit base and referred to as the user cost of

^{3/} For a longer discussion of these issues see: V. M. Jog and J. Mintz: "Corporate Tax Reform and its Economic Impact: An evaluation of the Phase 1 Proposals" in Mintz, J. and J. Whalley, eds., The Economic Impacts of Tax Reform, Canadian Tax Paper No. 84, Canadian Tax Foundation, 1989.

capital. This user cost of capital is the sum of the real cost of financing the investment and from depreciation. The relevant rate of return in this context is the real user cost. The idea is that for any private entity, physical capital and financial capital are alternative ways of acquiring future income. Therefore, the acquisition cost of physical capital must equal at the margin the price of financial assets that generate the same path of future income.

More formally, this framework assumes that the firm maximizes its market value or, equivalently, its Net Present Value (N.P.V.). In a continuous time approach and in a world without taxes, the net present value may be written as:

$$NPV = \int_0^{\infty} e^{-\rho(t)} (P(t)F(K(t)) - q(t)I(t)) dt \quad (2)$$

where

- ρ : the discount factor,
- P : the price of output,
- $F(.)$: the production function,
- q : the price of capital goods,
- I : the investment level
- t : time.

Without taxes, the discount factor ρ equals the market rate of interest r ($\rho=r$). The firm is assumed to be competitive and hence takes the paths of prices as given. The firm faces an initially given level for the capital stock:

$$K(0)=K_0 \quad (3)$$

and the capital stock evolves according to:

$$\dot{K}(t) = I(t) - \delta K(t) \quad (4)$$

where $K=\dot{K}/dt$ and δ is the rate of (exponential) economic depreciation.

The firm maximizes (2) subject to (3) and (4), that is:

$$\max \int_0^{\infty} e^{-\rho(t)} (P(t)F(K(t)) - q(t)I(t)) dt \quad (5)$$

$$\text{s.t. } \dot{K}(t) = I(t) - \delta K(t) \text{ and } K(0)=K_0$$

The current Hamiltonian for this problem may be written as:

$$H = P(t)F(K(t)) - q(t)I(t) + \lambda(t)(I(t) - \delta K(t))$$

The first order conditions for an interior solution for this problem imply that:

$$P \frac{\partial F}{\partial K} = q(\rho + \delta - \dot{q}/q) \quad (6)$$

The right hand side of (6) is the user cost of capital c :

$$c = q(\rho + \delta - \dot{q}/q) \quad (7)$$

Finally, p , the required real rate of return, net of depreciation real, on a marginal investment, is derived by rearranging (6) to define the cost of capital in real terms and subtracting depreciation:

$$p = \frac{P \cdot (\partial F / \partial K)}{q} - \delta \quad (8)$$

which, in equilibrium, may be written as: $p = \frac{c}{q} - \delta \quad (9)$

Without taxes, inflation or relative price changes, the real rate of return to the saver would be equal to the interest rate or: $p = r$.

2.2. The pre-tax rate of return in a world with taxes

If the corporate income tax was comprehensive and fully integrated with other taxes on capital and with the taxation of individuals, if there was no tax rate differentiation, and if depreciation was accounted for correctly, the tax system would have no effect on decision-making by firms. ^{4/} Firms would maximize profit by choosing the most efficient means of production and financing. Savings would go to the most efficient investments. However, the various differences between the desirable and the actual design of the CIT, combined with interactions with the other major taxes on capital, result in major price distortions in the capital market and lead to an inefficient allocation of resources in the economy. So, the next step is to introduce taxes in this framework and requires the identification of the various taxes that need to be accounted for. In Brazil, capital is taxed: (i) at the personal level under the personal income tax or through withholding taxes; (ii) at the firm level under the corporate income tax, and; (iii) through various indirect taxes and surcharges levied both at the federal and state level.

With taxation, the decision problem of the firm is similar to (4) but the expression for net present value (NPV) is now given by:

$$NPV = \int_0^{\infty} e^{-\rho t} (P(t)F(K(t)) - q(t)I(t) - T(\cdot)) dt \quad (10)$$

^{4/} Atkinson, A. B. and J. E. Stiglitz, Lectures on Public Economics, McGraw-Hill, 1980, pp.142-159. Actually the CIT would still have an intertemporal effect on the investment decision of the firm.

Once taxes are accounted for, the firm's discount factor reflects its financial policy and might differ from the interest rate, r . This issue is addressed separately in section 2.5. For the time being, the firm's financial policy will initially be assumed to determine exogenously ρ . $T(\cdot)$ denotes the tax function that determines the firm's tax liability net of any fiscal credits that may apply. The firm's objective may be written more explicitly as:

$$\begin{aligned} NPV^* = \max & \int_0^{\infty} e^{-\rho t} \{ (1-\tau) [PF(K,L)/(1+\xi)] - q(1+\phi)I \} dt + \\ & + \int_0^{\infty} \int_t^{\infty} e^{-\rho s} \tau q(1+\phi) D(s-t) Ids dt \end{aligned} \quad (10')$$

$$\text{s.t.} \quad \dot{K}(t) = I(t) - \delta K(t) \text{ and } K(0) = K_0$$

where τ : the effective business income tax rate,
 ϕ : the rate of taxes on capital goods,
 ξ : the rate of the product based VAT (the ICM and the IPI (ICM) are both product based;

Also, defining:

$$\int_t^{\infty} e^{-\rho s} \tau D(s-t) ds = A \cdot e^{-\rho t} \quad (11)$$

where A is the present value (at time t) of tax savings from depreciation allowances permitted by the tax law.

The current Hamiltonian for this problem may be written as:

$$H = (1-\tau) [PF(K,L)/(1+\xi)] - q(1+\phi)(1-A)I + \lambda(I - \delta K) \quad (10'')$$

The first order conditions for an interior solution for this problem imply that:

$$p \frac{\partial F}{\partial K} = \frac{q(1+\phi)(1+\xi)(1-A)(\rho + \delta - \dot{q}/q)}{(1-\tau)} \quad (12)$$

The user cost of capital now equals the right hand side of (10):

$$c = \frac{q(1+\phi)(1+\xi)(1-A)(\rho + \delta - \dot{q}/q)}{(1-\tau)} \quad (13)$$

This user cost of capital expression incorporates all taxes levied on Brazilian firms. As earlier, the real pre-tax rate of return is derived by rearranging the cost of capital equation and subtracting depreciation. The resulting formula for the pre-tax rate of return, p :

$$p = \frac{c}{q} - \delta = \frac{(1+\phi)(1+\xi)(1-A)(\rho+\delta-\dot{q}/q)}{(1-\tau)} - \delta \quad (14)$$

Since the Brazilian taxation of capital is perfectly indexed for inflation:

$$\dot{q}/q=0 \quad (15)$$

2.3 Pre-tax rate of return for firms with Tax Holidays

The existence of a plethora of fiscal incentives in Brazil is one of the most remarked characteristics of its tax system. The range and variety of their objectives are exceptionally wide. They include export promotion, sectoral promotion, regional promotion, input promotion and many types of very specific activities. There are 66 incentives programs available against business income taxes alone, for different kinds of sectors and assets. Almost every tax in Brazil is associated with its own set of fiscal incentives.^{5/}

Since the Brazilian tax law includes so many tax holidays, their modelling deserves special attention. In general, it is fairly simple and tax preferences can be modelled within the previous framework by selecting the appropriate value for the tax variable. Tax holidays are however more complex because they alter the time path faced by the firm for its investment decision. This section discusses the alteration of the previous framework needed to assess tax holidays.^{6/}

Take a firm that in the interval from 0 to t^* faces the business income tax τ^* and that after t^* , faces the tax with rate τ . The firm's problem for this case may be written as:

^{5/}Annex I summarizes the major incentive programs relevant for investment projects.

^{6/} The modelling of tax holidays within the King-Fullerton framework, in general, and the case of temporary business income tax reductions as been dealt with by Mintz (1988) in a discrete time framework. The version used here is a continuous time version based on Gaspar e Alpalhao (1989).

$$\begin{aligned}
NPV^* = & \max \int_0^{t^*} e^{-\rho^* t} \{ (1-\tau^*) [PF(K,L)/(1+\xi)] - q(1+\phi)I \} dt + \\
& + \int_0^{t^*} \int_t^{t^*} e^{-\rho^* s} \tau^* q(1+\phi) D(s-t) Ids dt + \int_{t^*}^{\infty} e^{-\rho^* t} \{ (1-\tau) [PF(K,L)/(1+\xi)] - q(1+\phi)I \} dt + \\
& + \int_{t^*}^{\infty} \int_t^{\infty} e^{-\rho^* s} \tau q(1+\phi) D(s-t) Ids dt \\
& \text{s.t. } \dot{K}(t) = I(t) - \delta K(t) \text{ and } K(0) = K_0 \quad (16)
\end{aligned}$$

as before, A^* is defined as:

$$\int_0^{t^*} e^{-\rho^* s} \tau^* q(1+\phi) D(s) Ids + \int_{t^*}^{\infty} e^{-\rho^* s} \tau q(1+\phi) D(s) Ids = q(1+\phi) A^* I \quad (17)$$

where A^* is the present value of the tax savings that follow from depreciation allowances. The current Hamiltonian for the firm's problem is then:

$$H = (1-\tau^*) [PF(K,L)/(1+\xi)] - q(1+\phi)(1-A^*)I + \lambda(I - \delta K) \quad (18)$$

for the interval from 0 to t^* .

The user cost of capital may then be written at time zero as:

$$c = \frac{q(1+\phi)(1+\xi)(1-A^*)(\rho^* + \delta - \dot{q}/q)}{(1-\tau^*)} + \frac{q(1+\phi)(1+\xi) \cdot A^*}{(1-\tau^*)} \quad (19)$$

The other steps needed to conclude the computations are exact replicates of those already presented. One major difference stems, however, from the fact that the cost of capital is not constant for this case even if the tax law does not change. That happens because depreciation allowances are a function of time (the postponement of investment allows larger depreciation allowances for the firm). In the numerical computations firms are assumed to depreciate their capital stock at the same rate during the holiday period. As shown in Mintz (1989) this is a crucial assumption.

2.4. After-tax rates of return

The modelling of the supply side of the capital market requires the derivation of the net rate of return to savings, s . This is analytically much simpler than the derivation of the gross rate of return relevant for the demand side of the market. Under Brazilian law, the only relevant tax for the savers is the personal tax or the final withholding tax levied at the source on capital

income. In most cases, these two taxes have the same rate and are perfect substitute. They can be viewed as a single tax. Since this aspect of the tax system is appropriately indexed, the derivation needs not built in any distortion due to inflation and the after-tax rate of return to the savers is expressed as:

$$s = (1-m)r \quad (20)$$

where m is the personal tax rate on interest income. Equation (20) assumes also perfect indexation for inflation.

2.5 The firms' after-tax discount rate

The last issue to be dealt with is the alteration of the firm's discount rate to account for taxes. Once taxes are introduced, the discount rate is no longer equal to the market interest rate. This discount rate will however vary according to the financing source of the investment project. Financing can be achieved through equity, retained earnings or debt. Often, the tax treatment of these three sources will differ. In Brazil, however, since 1989, retained earnings and equity are subject to the same tax treatment and are hence equivalent within the framework used here.

For debt finance, since interest income is taxed but is tax deductible at the firm level, the appropriate discount factor for after tax cash-flows is the net of tax interest rate:

$$\rho = r(1-\tau) \quad (21)$$

For new share issues and retained earnings, the relevant expression is:

$$\rho = \frac{1-m}{1-d} r \quad (22)$$

where d is the personal tax rate on distributable dividends (dividends actually distributed and retained earnings). (22) assures that the net of tax return on dividend income $(1-d)\rho$ equals the net of tax return on interest income $(1-m)r$.

3. Effective Tax Rates on Capital in Brazil

This section starts with a brief overview of the tax provisions relevant to the derivation of the MERT. It then presents the results of the computation of the MERTs for investment projects under the normal tax regime. It then turns out to the assessment of the major tax incentives programs in terms of their effect on the MERT.

3.1 Major Taxes on Capital in Brazil

3.1.1 Profits taxes

Until 1988, business profits were subject only to the corporate income tax (CIT) and to a withholding tax on distributed profits. ^{7/} In 1989, the Brazilian tax law allows four different taxes on business profits: the CIT, a surcharge levied by states on the tax revenue collected by the federal government from the CIT, a social contribution earmarked to finance social expenditures, and withholding taxes on dividends and retained earnings. Since they are all levied in sequence on business profits, they are described and assessed jointly.

Tax Base. The generic base for each one of these taxes is business income. The income definition considered for tax purposes includes, in principle, any increase in the firm's net worth. Thus the adopted definition conforms to the accepted convention of identifying income with increments in wealth. This means that, for instance, the deduction of the depreciation of productive assets is allowed in calculating income and that debt interest is tax deductible. There are however some differences for the exact base in each case.

For the corporate income tax, the computation of taxable income follows several steps. It defines taxable profits as the difference between gross receipts from sales and services and all production and financial costs as well as a number of specific deductions allowed by the law. The actual tax base, however, is narrower, since it also allows a large set of deductions reflecting the many tax incentives granted to corporations. For the Social Contribution, the tax base is essentially Taxable Profits, except for one major difference: it also allows the exclusion of exports profits from its base exports profits. No other fiscal incentives is allowed against the social contribution. For the State Tax, the base is simply the tax revenue collected by the federal government from the CIT and from the withholding tax on capital.

Sequencing of Bases. Since the four taxes are levied in sequence, their order matters for the computation of the effective tax rate on business profits. The social contribution is the first to be levied on all profits -- except exports -- before deductions for tax incentives. The amount paid for this social contribution is then deducted along with eventual incentives from the base, to obtain the taxable base for the CIT. The revenue from this computation is the base for the state tax. Once these taxes have been accounted for, equity income can be computed by deducting them from taxable profit. The withholding taxes are levied on the residual. The state tax is then levied on that withholding tax revenue.

Tax Rates. For the CIT, the standard rate is 30%, with an additional surcharge of 5% for income between 150,000 BTN and 300,000 BTN and 10% for profits over 300,000 BTN (financial institutions pay surcharges of 10% and 15% respectively). The tax treatment of agriculture remains favored. The sector

^{7/} The summary of the Brazilian CIT is designed to assess its role as a form of capital income taxation. It covers the major provisions of the corporate income tax directly affecting the cost of capital and introducing a wedge between the gross and net rate of return in the capital market.

pays a 6% tax rate and is also allowed generous acceleration of depreciation (investments are costed at 2 to 5 times their actual value), to deduct actual costs up to 9 times their actual value in the computation of their taxable income. This reduces their effective tax rates to 0 on a fairly permanent base.

The Social Contribution is levied at a rate of 8% for most firms (12% for financial institutions), on net profits as computed for the CIT, before any fiscal incentive has been taken into account. The state tax on capital income is levied at the rate of up to 5%, maximum on the federal revenue collected within the state from capital income taxes (essentially the CIT and the withholding taxes on dividends and retained earnings in this case). With a CIT rate of 30%, the maximum impact that the local tax may have on business income is 1.5%. States can allow a discount on that rate but few have so far decided to do so. The withholding tax on equity income is levied at 8%.

Depreciation. Depreciation rates allowed for tax purposes are determined by the tax authorities. The most important are: machinery and equipment, 10%, installations, 10%, buildings, 4%. These rates apply to the useful life of a fixed asset in normal use in eight-hour shifts. Depreciation rates are increased by 50% or 100% for machinery and equipment used in two or three eight-hour shifts, respectively. Higher rates can be permitted given appropriate evidence.

Accelerated Depreciation. Accelerated depreciation is allowed for new capital assets produced in Brazil and for capital assets necessary for projects in certain industries. As a rule, the rate of accelerated depreciation is twice the normal rate and is to be added to normal depreciation. However, the sum of ordinary and accelerated depreciation is not permitted to exceed the acquisition cost of goods, adjusted for inflation.

Indexation for Inflation. Brazilian law recognized that inflation produces an appreciation of permanent assets and distorts net worth. The indexation procedure ("monetary correction") allows for the restatement of specific items of the balance sheet:

- all permanent-asset accounts which include fixed assets, investments, depreciation and amortization accounts; and
- net-worth accounts including capital, capital reserves, retained earnings and accumulated deficits.

The difference between the corrected value of adjustable items and their previous value was added to the corresponding account and compensated with a corresponding entry in the income statement (a special adjustment account) labelled, as a rule, "monetary correction." The adjustment of permanent-asset accounts is registered as a credit in the special-adjustment accounts and the adjustment of net worth counts as a debit.

Any loss appearing in the monetary-correction account is deductible for tax purposes. However, corporations may choose to defer the tax on unrealized inflationary gains. The definition of realized inflationary gains was provided in the Brazilian tax law. The adjustment for inflation does not apply to inventories (other than immovable property held for sale by enterprises engaged in the real estate business).

3.1.2 Indirect Taxes

In Brazil, capital goods are subject to indirect taxes. Domestic machinery is subject to the IPI, a 7.5% (on average) federal tax on manufactured products and to the ICM, a 20.5% state tax on industry and services transactions and an 12.5% (on average) import tax. Buildings are only subject to the ISS, at a tax on service of 5%. Both the IPI and the ICM are product--rather than consumption-- based value added taxes which is why they introduce a tax wedge in the capital market. Imported capital goods are subject to the IPI and the ICM as a rule but may be exempted when benefiting from incentives.

3.1.3 Tax Incentives

Brazilian tax law uses tax incentives very intensively. In 1988, 66 different incentives programs each reduced CIT liability, mainly to promote sectoral or regional growth. Another 41 set of incentives also allows reductions in IPI indirect tax liabilities. They lead to a revenue loss of at least 1.6% of GDP for the federal government. They include rate reductions (most notably agriculture), increases in deductions allowed (again for agriculture), reductions in taxable profits (mostly for certain regional operations like the ZFM, and for exports), and accelerated depreciation for approved projects. Many of these incentive programs can be used cumulatively, and are intensively used by firms to decrease their tax liabilities. A detailed description is provided in the Appendix.

Since there is such a wide variety of incentives in Brazil, the paper will focus on the analysis on the tax preferences leading to the largest revenue losses. These include various types of regional tax incentives (0.3% of GDP in revenue loss) and exports incentives (0.1% of GDP in revenue loss). The relevant technical details are introduced as needed in the next section.

3.2 The Normal Tax Treatment as the Base Case

The base case characterizes a marginal investment project by a firm subject to a normal tax treatment, without the benefit of any fiscal incentive but with a net profit sufficient for its profits to be subject to a 10% federal additional tax -- a surcharge -- on its income. The firm benefits from straight line depreciation at rates of 10% for industrial machinery and 4% for buildings. The appropriate economic depreciation is assumed to be exponential at the same rates. The firm is also subject to a state surcharge on income from capital and to the new social contribution. It pays the tax on retained earnings and dividends. Interest income is also taxed. The firm pays indirect taxes -- the IPI, the ICM and import tax -- on all its capital goods purchases. The IPI and the ICM have to be included in the computation in spite of being value added taxes because their base is product rather than consumption as in most other countries using VATs. The MERTs are computed for two types of productive capital (machinery and buildings), and three types of financing (debt, equity, and retained earnings), with the last two being equivalent under the 1989 tax

system. ^{8/} Table 1 summarizes the data requirements for the computation of the marginal effective tax rate in the base case. The MERTs obtained from that data illustrate the set of issues resulting under the most straightforward application of the tax law.

Table 1: DATA FOR THE COMPUTATION OF THE BRAZILIAN MERT

Relevant Legal Features	Value in the base case
(1) of tax liability invested in special funds	0
(2) effective social contribution rate	0.08
(3) % of profits earned from exports	0
(4) real interest rate	0.10
(5) effective CIT (excluding social contribution) computed as CIT rate (30%) + federal (10%) and state (5% on 40%) additional correcting for reduced rate (6%) on exports profits	0.38
(6) effective total tax rate on profits = (5) + (2)	
(7) depreciation allowance (straight line)	
Industrial Machinery	0.10
Buildings	0.04
(8) indirect taxes	
on machinery: federal (IPI, 7.5%; import, 12.5%)	0.20
state (ICM)	0.205
on buildings (ISS)	0.05
(9) tax on interest income	0.25
(10) tax on distributed dividends	0.08
(11) tax on capital gains	0.08

The results of the base case, summarized in Table 2, confirm one of the tentative conclusions drawn from the macroeconomic stylized facts. Brazilian MERTs derived from the normal tax treatment of investment projects are high by international standards. This may explain the relatively low level of investment in Brazil. Even if the MERTs in OECD presented in Table 2 are not strictly comparable and are presented here for purely illustrative purposes, they allow

^{8/} The rates were computed assuming that Brazil was equivalent to a closed economy with respect to the price of capital.

to conclude that the Brazilian MERTs are too high. 9/ Only the Netherlands, Denmark, and Norway were on average worse off than Brazil among the 19 OECD countries covered by the OECD average. The major factors explaining the Brazil's outlier status are of two types. First, Brazil's number of taxes levied on profits is much larger than in most other OECD countries. Second, Brazil's value added taxes are product based, while in most other countries, indirect taxes are not levied on capital goods and when VAT are adopted, they are levied on consumption, not production.

In addition, the base case results reveal two more problems due to the current design of the taxation of capital in Brazil. First, the tax treatment of assets is differentiated by type of asset. The Brazilian MERTs are systematically smaller for buildings than for machinery. This results from much smaller indirect taxes levied on buildings. Buildings are only subject to the ISS, the tax on services. Machinery is subject to the IPI, the ICM, and the import tax. Second, taxes also distort financing decisions in Brazil. Debt should be the preferred instrument because it benefits from lower tax rates under both the old and the new regime. These are two important items to be included in any tax reform agenda in Brazil.

**Table 2: MERT IN BRAZIL BEFORE AND AFTER THE 1989 REFORM
COMPARED TO MERTs IN THE OECD AND EAST ASIA**

Financing Mean	Machinery		Buildings	
	Brazil 1989 Normal	OECD 1983 avg	Brazil 1989 Normal	OECD 1983 avg
Debt	55.8%	11.0%	39.8%	19.4%
New Share	68.1%	62.8%	66.4%	64.4%
Retained Earnings	68.1%	32.5%	66.4%	46.6%

Source: For Brazil, Bank staff calculations, for OECD, Table 11, average inflation, in McKee et al., 10/

9/ The issue of sustainability of such high rates is not addressed explicitly here. It is however clearly related to the Brazilian protection level. Tax policies aiming at increasing the utility level of residents of a net demander of capital may justify restriction in net demand, if the country faces a non-horizontal supply curve. See Hartman, D. G., On the Optimal Taxation of Capital in the Open Economy, NBER Working Paper 1550 and The Welfare Effects of a Capital Income Tax in an Open Economy, NBER Working Paper 1551.

10/ See McKee et al., Marginal Tax Rates on the Use of Labour and Capital in OECD countries, OECD Economic Studies, No.7, Autumn 1986; their results are not strictly comparable to those derived for Brazil. The Brazilian MERTs are based on a very detailed analysis of the Brazilian tax system. McKee's result are essentially intended to compare all OECD countries and are not based on a detailed assessment of each tax system.

3.3 Accounting for Tax Incentives

As just illustrated, the normal tax treatment of capital leads to unusually high MERTs. However, one of the outstanding characteristics of Brazil's tax system is that it provides potential investors with a plethora of tax incentives. These incentives are expected to reduce the deterrence to invest due to the high MERTs resulting from the normal tax treatment. Intuitively, it would seem that since investment is not growing as fast as in similar countries, it must be that these incentives do not reduce the Brazilian MERTs enough. This section shows the results of simulations of the effects on the MERT of the major tax incentive programs available in Brazil.

Three major types of fiscal incentives were assessed. The first is accelerated depreciation. The second are benefits granted to exporters. The third is to regional development. This third type is itself composed of two categories: (i) tax benefits granted for investment in regional development funds -- FINOR, FINAM and Fiset; (ii) tax holidays granted for investment in particular regions: mainly SUDAM, SUDENE, and the Manaus Free Zone (ZFM) -- which, in addition, benefits from the exemption from IPI and import taxes. ^{11/}

3.3.1 Major Sources of Distortions In the Brazilian Capital Market

Table 3 summarizes the results of simulations of the effects of all the major tax incentive programs. Graph 2 provides a visualization of the relative differences in MERTs. The MERT on an hypothetical investment project ranges from 10.4% to 68.1%. It varies by type of asset (machinery vs. buildings), sector, region, market orientation (domestic vs. export), country origin of capital goods (domestic vs. foreign) and means of financing (debt vs. equity). The highest MERT falls on an investment in industrial machinery financed by new share issues or retained earnings and subject to the normal direct and indirect tax treatment -- meaning without the benefit of any fiscal incentive. The lowest rate falls on the same machine financed through debt and freed from any indirect tax liability -- i.e., subject to true zero-rating for all VATs.

The results show that few tax incentives can effectively reduce the deterrence effect on investment caused by taxes. In fact, tax incentives need to be targeted to the major source of the distortion due to taxes in the capital market. Table 2 shows that indirect taxation, not the CIT, is the major source of effective taxation a marginal investment project. This suggests that the simplest way for Brazil to reduce its MERT to international levels would be to transform its product based value added taxes into consumption based value added taxes. None of the other incentives programs work as efficiently. In fact, in general, the incentives targeted at the profits taxes hardly reduce their deterrence effect. In some cases, they even have a perverse effect and lead to an increase in the MERT rather than a decrease. For instance, regional incentives may raise rather than reduce the MERT on capital. But these are only the major conclusions emerging from the results. Table 2 allows a more detailed assessment of each one of the incentives programs. The rest of this section presents a detailed discussion of each one of these results.

^{11/} See Appendix on Fiscal Incentives for details.

3.3.2 Indirect Taxes as the Major Issue.

In Brazil, the easiest way to reduce the effective tax rate on capital is not to cut the CIT but to cut the indirect taxes on capital goods. Reductions in the effective CIT rate never reduce the MERT as effectively as the suppression of indirect taxes. A simulation suppressing all indirect taxes on capital -- with the rest of the data as in the base case -- shows that the MERT on machinery declines from 55% to 10.4% with debt financing and from 68.1% to 42.6.7% with equity or retained earnings financing. For buildings, the suppression of indirect taxes cuts the MERT from 39.8% to 16.7% for debt financing and from 60.4% to 46.9% for equity financing. ^{12/} The cut is lower for buildings for two reasons. First, current indirect taxes on buildings are lower than those levied on machinery. In addition, both the IPI and the VAT are essentially product-based taxes which, implicitly, include depreciation in their base. The longer the life of the asset, the lower the relative importance of the depreciation. All in all, however, the differences in rates explains why indirect taxes in Brazil discriminate against short-lived assets.

Table 3: MARGINAL EFFECTIVE TAX RATES ON INVESTMENT IN 1989

Tax Status of the firm	Financed through Debt		Financed Through Equity	
	Machinery	Buildings	Machinery	Buildings
Base Case	55.0%	39.8%	68.1%	60.4%
Normal Corporate Tax no indirect taxes	10.4%	16.7%	42.6%	46.9%
Regional Investment Funds	55.9%	40.8%	66.2%	57.2%
Regional Tax Holidays	61.0%	43.2%	55.3%	33.2%
Zona Franca de Manaus	47.4%	43.2%	35.2%	33.2%
Accelerated depreciation	48.1%	33.1%	62.4%	56.0%

3.3.3 Investment in Regional Development Funds.

This first type of regional incentive allows any Brazilian firm to invest up to 40% of its income tax liability in special investment funds -- basically PINOR, FINAM and Fiset. This is modelled as a reduction in the effective CIT rate computed as follows. If the rate of return on these investments were the same as those the firm could obtain elsewhere, this would

^{12/} Note that this simulation provides the results that would obtain if the Brazilian VATs were to be fully consumption based rather than the current hybrid of a consumption base with a product base VAT, with the characteristics of the second dominating.

be equivalent to a 40% reduction in the CIT rate. However, the returns on these investments are widely believed to be very low and hence the rate reduction is not that high. For illustrative purposes, we assumed that the rate of return on these regional funds is a third of the normal rate of return. It could be argued that this represents an upper limit rather than an approximation of the actual rate of return. In any case, the MERT computed then provides an upper limit for the reduction in MERT through these incentive programs. They are computed for the case of a firm investing up to the limit in those special funds.

Two conclusions emerge in the case of investments in regional development funds. First, they do not alter the MERT significantly. Second, and more surprising, while the MERT falls somewhat in the case of equity financing, it increases in the case of debt financing. In other words, the size of the distortion increases rather than decreases, reducing the incentive to invest. This may seem counter-intuitive. It results from the tax treatment of interest payments. Since they are deductible as a cost, the firm's discount factor increases, causing the effective tax rate to increase as well.

3.3.4 Regional Tax Holidays and the ZFM.

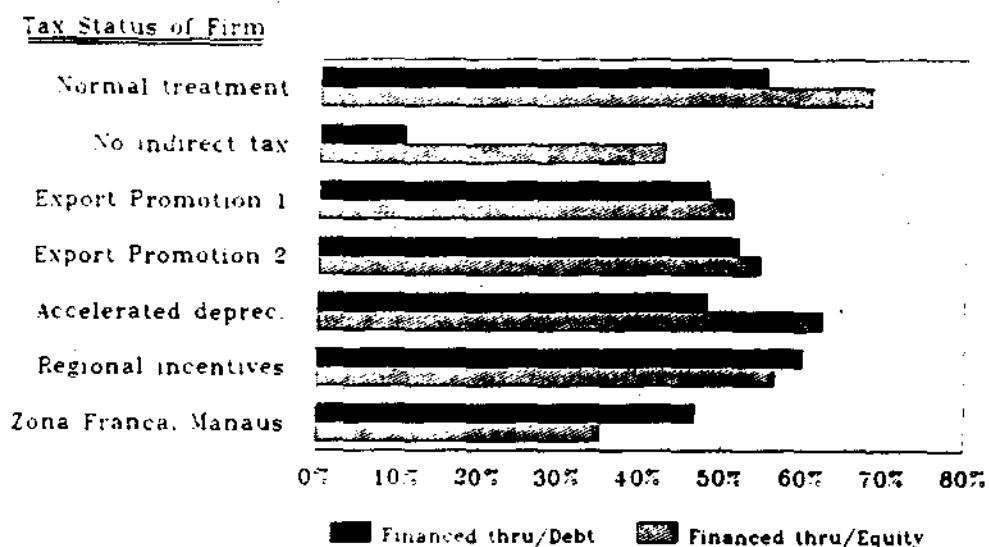
This second type of regional incentive takes the form of tax holidays. 13/ Two major results emerge here. First, The maximum reduction in MERT that can be obtained from SUDAM or SUDENE is not significant. In the case of debt financing, an increase in MERT can occur. Hence, the second major result is that equity financing should always be preferred over debt financing. The explanation is somewhat complex but it is worth discussing.

The distinguishing features of this type of incentive is that it is time dependent. The MERT is likely to be different for each year during the tax holiday period. A full awareness of the time path of the MERT resulting from the tax holiday may provide an incentive to postpone investment. Hence the effects of tax holidays on investment are hard to assess. 14/ To obtain time invariance of the investment decision, the model assumes perfect foresight by the firm of the length of the holiday and of the future tax regime. The MERT can then be computed for each year for the full duration of the tax holiday. For illustrative purposes, Graph 2 shows the MERT under debt financing for a 15 years tax holiday granted to an investment in the ZFM. In the long run, as shown by Mintz, if the firm must write down the value of its assets for tax purposes during the holiday period, the tax depreciation writeoffs after the tax holiday may be inadequate relative to the true depreciation cost. As a rule, if there are no deferrals of tax depreciation writeoffs as is the case in Brazil, the MERT on depreciable capital during the holiday is positive/negative, if the tax depreciation rate is more/less than the true economic depreciation rate. The results assume 15 year holidays and a zero CIT rate. Table 3 indicates the annual average MERT over the 15 year period.

13/ A tax holiday allows a firm operating in a given region or sector to be fully or partially exempt from CIT during for a specified duration. Full taxation applies after the end of the holiday.

14/ A fuller discussion is available in Mintz, J., Tax Holidays and Investment. PPR Working Paper No. 178, April 1989, the World Bank.

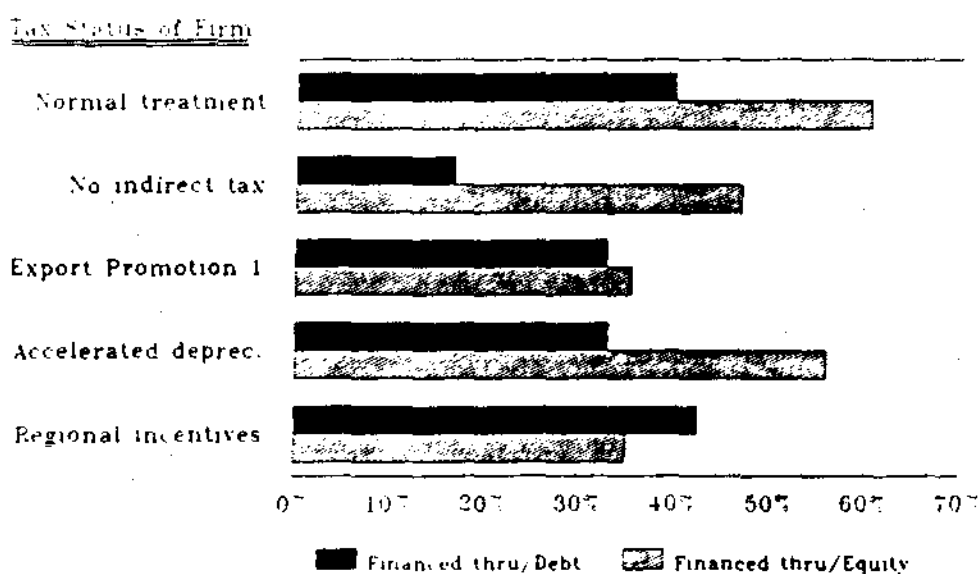
Brazil: Marginal Effective Tax Rates on Investment in 1989 - Machinery



Export promotion 1 is to users of domestic capital, export promotion 2 is to users of foreign capital.

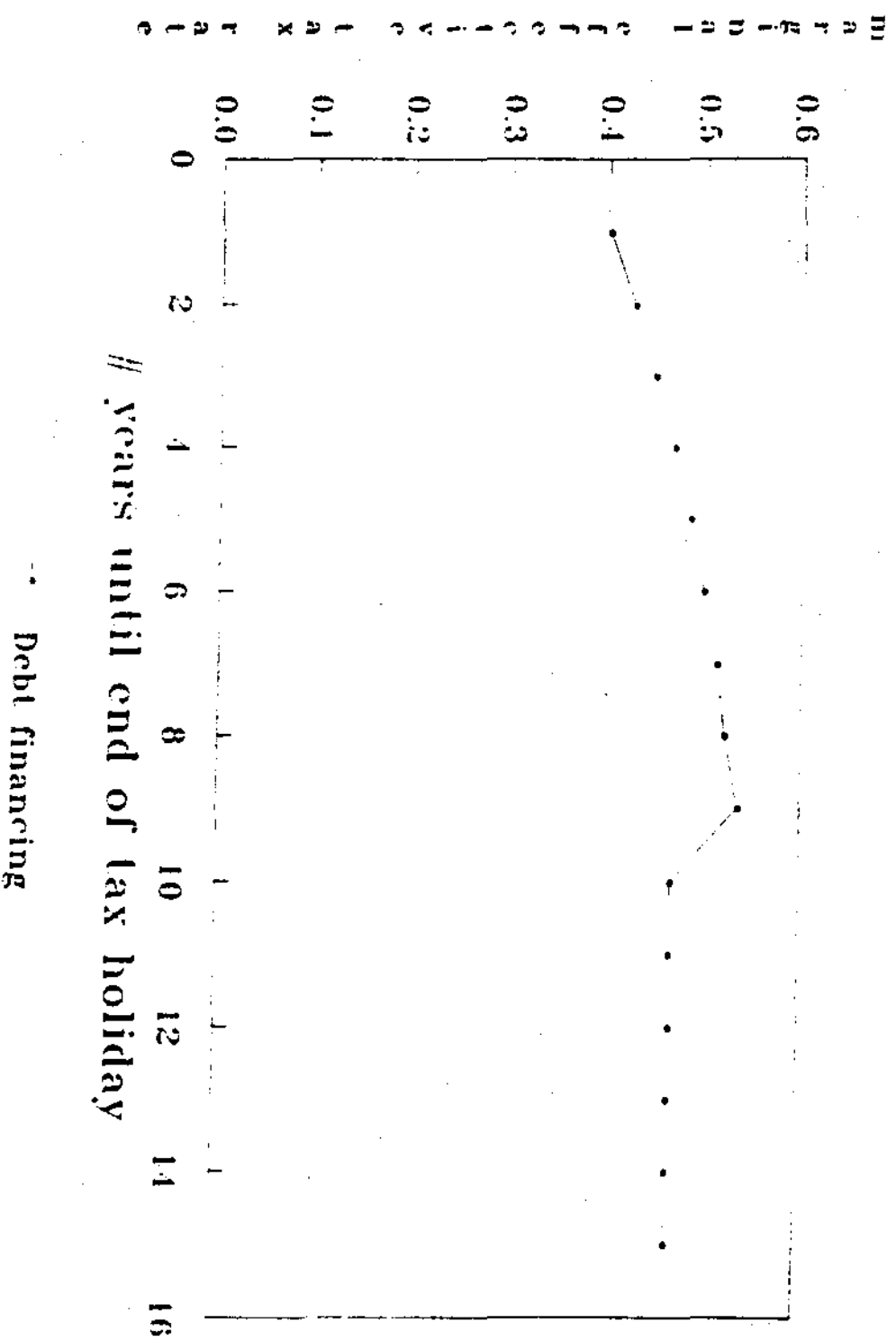
GRAPH 2-B

Brazil: Marginal Effective Tax Rates on Investment in 1989 - Buildings



Export promotion 1 is to users of domestic capital.

Brazil: Regional Incentives (Industrial Machinery) – Zona Franca de Manaus



In applying the model to Brazilian tax law, the only difference between the ZFM and the other regional tax holidays is that the latter pays indirect taxes while the former does not. This also explains why investments in the ZFM have a lower MERT. Otherwise, without this tax break, tax holidays would on average result in increases in MERT in the case of debt financing for an investment in SUDENE or SUDAM, where the average MERT increased from 55% to 61%. The reason for this counter-intuitive increase in MERT is provided by the rule explained in the previous paragraph. On average, the tax depreciation rate during the holiday is much higher than the actual depreciation rate while the opposite holds after the holiday. As a result a penalty is imposed for the remaining life of the asset, after the tax holiday. The relative importance of this penalty increases with the duration of the life of the asset. The importance of this effect in the case of the ZFM is fully dominated by the indirect tax reduction. An investment in machinery in the ZFM has a MERT of 46.4% against 55% in the base case for the debt financing case. The tax break is even larger -- almost 50% reduction -- in the case of an equity financed asset since the spurious effect due to the allowance of deductions for interests payments is no longer present.

3.3.5 Accelerated Depreciation

In general, the rate of accelerated depreciation is twice the normal rate and is added to normal depreciation. This is the assumption built into the results provided in Table 3. As expected, accelerated depreciation reduces the MERT. However, the reduction in the MERT is not dramatic. The MERT only declines by 7-17% -- depending on the type of asset and on the financing used. Note, however, that the new tax law has resulted in a minor increase in the MERT for debt financing. This is explained by the fact that accelerated depreciation is not available for the new social contribution levied on profits.

Table 4: MARGINAL EFFECTIVE TAX RATES ON EXPORTERS' INVESTMENT IN 1989

% of Exports in total sales	Financed through Debt		Financed Through Equity	
	Machinery	Buildings	Machinery	Buildings
0% (=Base Case)	55.0%	39.8%	68.1%	60.4%
10%	49.9%	35.3%	59.4%	50.3%
40%	48.7%	33.5%	53.2%	40.8%
50%	48.2%	32.9%	51.0%	35.5%
100%	45.1%	28.5%	37.6%	17.0%

3.3.6 Exports Incentives

The assessment of the effect of exports incentives on the MERT is unusually complex. It is best illustrated by a set of simulations for varying shares of exports sales in total sales. With respect to the model, the relevant variable is the share in terms of sales revenue, not profits. The results of those simulations are presented in Table 4. The CIT rate on exports profits is assumed to be 6%. Exporters also benefit from an exemption from the new social contribution. Exports are assumed to be exempted from the ICM and from federal indirect taxes.

Table 4 suggests the following conclusions. First, and somewhat unexpectedly, the method of financing that minimizes the MERT is different for producers with a small share of exports in their production than for producers with a large share of exports. The exact turning point was calculated to be at 65%. The preferred financing means for a firm exporting less than 65% is debt, while it is equity or retained earnings for firms producing 65% or more. This result is explained by the deductibility of debt-financed investment. The value of such distortions is larger, the larger the effective tax rate on the firm's.

Second, the MERTs reductions can be significantly larger for equity financing than for debt financing and are therefore more likely to lead to a stimulation of investment for the former financing means. In the case of equity, the MERT for machinery could drop from 68.1% to 37.4%, and for buildings by as much as 43% (from 60.4% to 17%). In the case of debt the maximum cut would only be 10% for any asset type.

Third, and maybe more importantly, in the case of machinery, the revenue costs of a reduction in the effective CIT rate is very high, for a relatively small drop into the MERT (10% at the most). To see this, assume that a firm decides to specialize fully either in domestic consumption or in exports. If it is domestically oriented, it faces the base case MERT. If it is fully outward oriented, it faces the 100% case in Table 4. The decision to move from one extreme to the other results in a cut in the CIT rate from 30% to 6% and an exemption from the new social contribution. These translate into a reduction in tax revenue on profits of over 80%.

3.3.7 Imported vs. Domestic Capital Goods

So far, the firms have always been assumed to invest in domestic capital goods. Two major differences would occur if the firms invested in foreign capital goods instead: (i) foreign capital goods are burdened with larger indirect taxes (from which export firms may be exempted in Brazil); (ii) foreign capital goods cannot benefit from accelerated depreciation. This results in discrimination against the use of foreign capital goods as illustrated by Table 5. The MERT for a firm producing for the domestic market using foreign capital goods is compared to the case of the firm using accelerated depreciation and investing to the limit in regional investment funds. Also, the MERT is computed for a firm with 50% exports using foreign machinery, compared to the same firm using only domestic machinery. The results are summarized in Table 5.

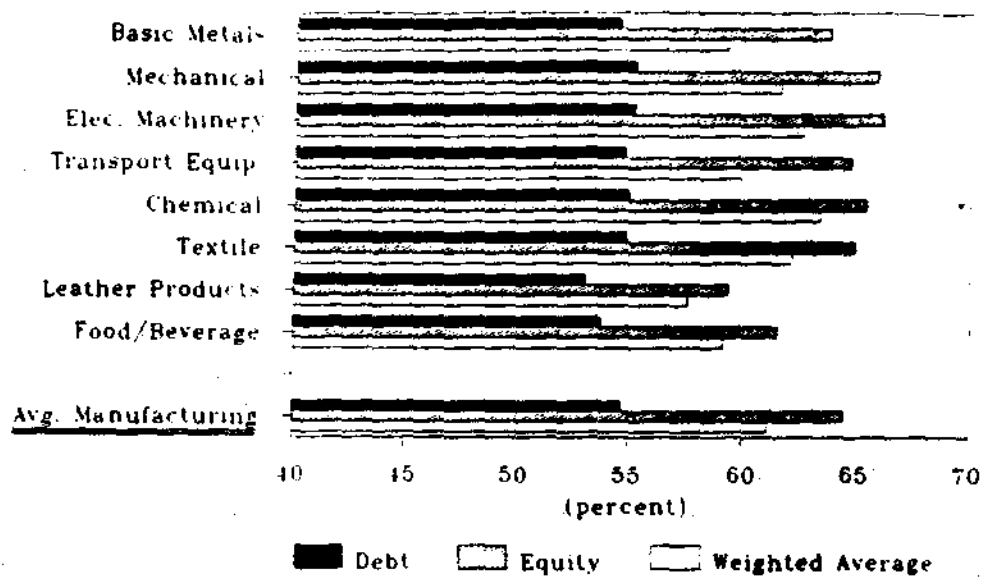
Table 5: COMPARING DOMESTIC AND FOREIGN CAPITAL GOODS

Tax Status of the firm	Financed through Debt	Financed Through Equity
	Machinery	Machinery
Accelerated depreciation cum regional funds for domestic oriented user of domestic capital goods	50.2%	61.2%
Accelerated depreciation cum regional funds for domestic oriented user of foreign capital goods	71.7%	77.6%
Accelerated depreciation cum regional funds cum export promotion to user of domestic capital (export = 50% of sales)	51.9%	54.5%
Accelerated depreciation cum regional funds cum export promotion to user of foreign capital (export = 50% of sales)	52.6%	51.5%

3.3.8 Sectoral Distortions

So far, the discussion focused on the individual effect of tax provisions on the MERT on a theoretical investment project. To assess the differentiation of MERTs across sectors, average effective marginal tax rates were computed for the firms included in the manufacturing sector of the Balanco das Mil Sociedades Por Acoes published by Conjuntura Economica (March 1988). The results are likely to show some systematic bias, since the survey covers only the larger firms. In addition, the marginal tax rate on the various means of financing had to be assumed to be equal to the average tax rates computed from the sample, since the publication only provides data on averages. Finally, with respect to incentives, comparable sectoral data provided by the SRF was used when possible. Not all incentives could be assessed. No data was available on accelerated depreciation, for instance. The results of the computations are presented in Table 6 and in Graph 3.

Marginal Effective Tax Rate on Industry: Industrial Machinery



GRAPH 4-B

Marginal Effective Tax Rate on Industry: Buildings

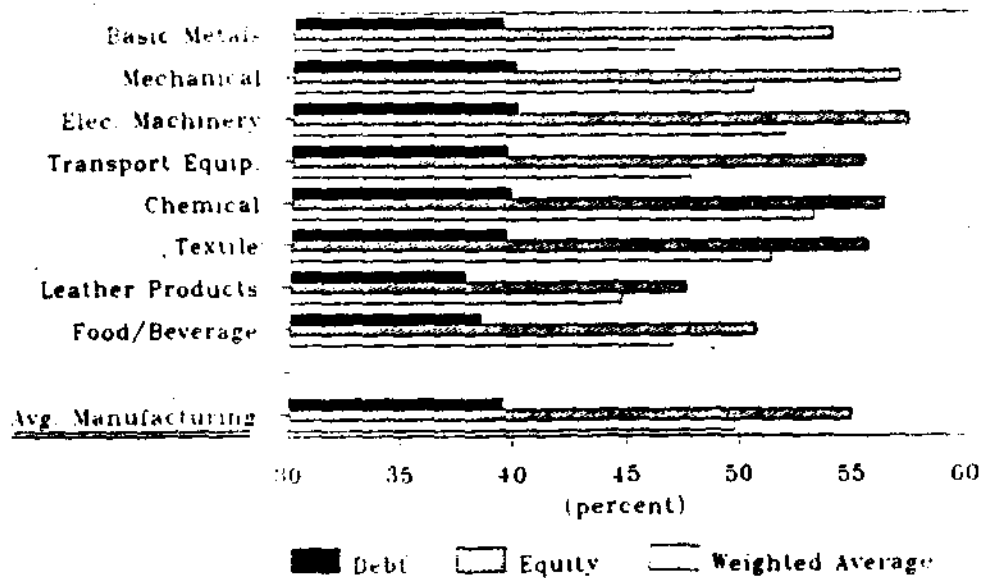


Table 6: MARGINAL EFFECTIVE TAX RATE ON INDUSTRY (in %)

	Industrial Machinery			Buildings		
	Debt	Equity	Average	Debt	Equity	Average
Theoretical Base Case	55.0	68.1	n.s.	39.0	68.4	n.s.
Manufacturing	54.7	64.5	61.1	39.5	55.0	49.8
Basic Metals	54.4	63.7	59.1	39.2	53.9	46.9
Mechanical	55.1	65.8	61.5	39.9	56.9	50.4
El. Machinery	55.1	66.1	62.5	40.0	57.3	51.9
Transport Equipment	54.7	64.7	59.8	39.6	55.4	47.7
Chemical	54.9	65.4	63.3	39.8	56.3	53.2
Textile	54.8	64.9	62.1	39.6	55.6	51.3
Leather Prod.	53.0	59.3	57.5	37.8	47.5	44.7
Food and Beverage	53.7	61.5	59.1	38.5	50.7	47.0

Aside from the clear differences between debt and equity financing, and between investments in machinery and buildings, the spread of MERT across sectors is also large. To illustrate the impact of these differences, an investment in buildings in the leather product sector financed with debt has a MERT of 37.7%, while an investment in industrial machinery in the electrical machinery industry is subject to a MERT of 63.3%. Table 6 also shows that equity financing is relatively more combined with the use of tax benefits, since only in that case is the difference between the theoretical base case and the actual figures significant. It is also in the case of equity financing that divergences from the manufacturing mean are more significant.

3.3.9 An Important Footnote on Tax Incentives and Tax Evasion.

An important implicit assumption underlying the analysis so far was that firms comply with the tax law. The assumption is clearly strong in the current Brazilian context. Tax evasion can however usefully be related to tax holidays. In fact, tax holidays provide an easy opportunity for tax arbitrage when there is an association between tax holiday firms and normal tax paying firms. Income from tax-paying units can be shifted into tax holiday units and tax deductible costs can follow the opposite trajectory in order to minimize corporate tax payments. ^{15/}

The differential tax treatment across assets, industries or modes of financing provides many incentives for tax arbitrage. The multiplicity of opportunities for tax avoidance and evasion also increase tax administration costs and reduce its efficiency. In addition, tax arbitrage essentially results in reductions in average tax rates, which in turn means lower tax revenue. For instance, a form of arbitrage that could take place in Brazil involves interest payments. A firm subject to a high effective tax rate such as an industrial firm, borrows from a firm subject to a low tax rate, such as in the agricultural sector. Since interest paid is deductible from the CIT, it reduces the tax base

^{15/} See Mintz, *op. cit.*, p. 21 on this.

and hence the tax liability for the industrial firm. For the agricultural firm, the interest income is taxed at a low marginal tax rate. The two firms split the net profit of the transaction. The average tax rate levied on the industrial production and the total tax revenues are both lower. ^{16/}

4. Conclusions

The objective of the paper was to explain an apparent paradox in Brazil: the coexistence of a poor investment performance and of little revenue from the taxation of capital due to multiple tax incentives granted to investors. As indicated earlier, the Brazilian taxation of profits yields less revenue than in similar countries, despite very comparable statutory tax rates. In spite of this, according to the 1989 World Development Report, Brazil's investment rate was under 20%, a figure significantly smaller than the upper middle income countries average. To a large extent, the results presented here allow a plausible explanation of this paradox.

The assessment of all the major tax incentives programs in terms of their effectiveness at cutting the MERT on capital shows that most are not very powerful instruments for promoting marginal investment. They often do not provide significant MERT cuts from the normal tax treatment of an investment, or only provide a tax break to investors already installed. In fact, in general, incentives are unlikely to be the decisive factor in the decision to invest, except, maybe, for the case of the ZFM where for certain sectors, the benefits from the indirect tax exemptions can be quite critical. Incentives targeted at indirect taxes are the only tax preferences successfully providing an incentive to invest.

The paper also shows that fiscal incentives are more efficient at reducing revenue than at stimulating investment. The official figure for federal revenue loss due to fiscal incentives of 1.5% of GDP is underestimated. Even if it covers the major programs, it does not account for the reduction in average tax rates obtained through incentives. Many producers decrease their average tax liability by offsetting profits in highly taxed profitable sectors with losses in less profitable low taxed investments, such as in agriculture. The procedure is, in general, illegal but difficult to detect without thorough auditing. This illustrates that the multiplicity of fiscal incentives (there are 66 different programs) leaves many loopholes in the tax system, which are extensively exploited by taxpayers to reduce their tax burden. The multiplicity

^{16/} To see this, assume that the industrial firm -- X -- has a profit of 100 from its production activity. Assume the agricultural firm -- Y -- has no profit. The corporate tax rate on industry is 50%, the rate on farming is 10%. Hence, X's normal tax liability would be 50, Y's would be 0. Now, assume the industrial firm borrows 200 from the agricultural firm at an interest rate of 10%. X can deduct 20 (10% of 200) from its profit and has now a taxable base of 80 (100-20). Its new tax liability is 40 (50% of 80) instead of 50 under the normal tax regime. Y owes a tax of 2 (10% of 20, its interest income) which will be picked up by X, informally. Total tax revenue declined from 50 to 42; the average tax on X's production moves from 50% to 42% and there is no additional production in agriculture as a result of its preferential tax treatment.

of incentives also adds to the complexity of the system and results in opaque tax accounting, which eases tax evasion. In sum, while most tax incentives do not cut marginal tax rates, all reduce average tax rates and this explains the coexistence of low revenue yield of the Brazilian CIT and of a poor investment performance.

Besides resolving the paradox emerging from the stylized facts, the analysis also allowed the identification of other distortions which further reduce the growth potential of the economy. The simulations illustrated that, through interactions with other taxes and as a result of the extensive use of fiscal incentives, the taxation of capital introduces several types of distortions, discriminating between:

- (a) means of financing -- debt vs. equity/retained earnings;
- (b) assets -- machinery vs. buildings or equivalently, short-lived vs. long-lived assets;
- (c) sectors -- agriculture vs other;
- (d) regions -- SUDAM, SUDENE, SUFRAMA vs. others;
- (e) market orientation -- domestic vs foreign; and
- (f) origin of capital goods -- domestic vs. foreign.

Finally, the results show that the current system of depreciation allowances is also a source of distortion. Diversification of rates at the corporate level implies that the value of depreciation rules is lower to firms facing lower tax rates than to those facing higher rates when there are provisions limiting on forward carrying of losses. This is a major factor in explaining inter-asset, inter-financing, and inter-sectoral distortions; finally, progressivity at the source differentiates unduly by ignoring the actual ability to pay of the owners of capital.

In conclusion, to recover revenue and investment simultaneously, Brazil can hardly avoid a reform of its tax system and, in particular, a revision of most of the rules defining the tax treatment of capital. If Brazil is to reform its taxation of capital, its highest priority will have to be a reform of its major indirect taxes. Only consumption based VATs would achieve a significant reduction in MERT, and hence in the deterrence to invest. They would do so more efficiently than any of the incentive programs. It would also restore Brazil's attractiveness for international investors by making its MERT comparable to those observed in the OECD countries. An agenda for reform should also include a dramatic simplification of the corporate tax law. Its current complexity eases and leads to avoidance and evasion. This simplification is unlikely to be achieved without a suppression of most incentive programs. This suppression would not increase the deterrence to invest since in most cases, tax incentives do not reduce the MERTs significantly. It would also have the advantage of increasing tax revenue.

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APPENDIX I

DESCRIPTION OF THE PRINCIPAL BRAZILIAN FISCAL INCENTIVES1. Introduction

The Brazilian definition of fiscal incentives has recently been clarified during the debates preceding the preparation of the first annual budget for fiscal incentives mandated by the new Constitution. The Brazilian team working on the preparation of the budget defines a fiscal incentive as a public expenditure implemented through the tax system to achieve economic and social objectives. The incentive can be identified in the tax law as an exemption to the normal law leading to a reduction in the tax liability of the tax payer. These reductions identified in the budget are classified according to five types and are:

- (a) exemptions or tax reductions: revenues totally or partially excluded from the base and tax rates reductions; the tax treatment of exports profits comes under this category;
- (b) tax deductions: additional deductions from the base of a tax that should not take place under the normal tax law; accelerated depreciation would come under this category;
- (c) tax credits: credits against the tax liability that partially, fully or more than fully offset the tax liability; an example of such credits is provided by the legal treatment of employees' training costs paid by the employer;
- (d) tax rates reductions: many imports for instance benefit from rates reductions on their IPI or import tax; and
- (e) deferrals of the tax liability: the Brazilian incentives budget will also include the deferrals of tax liabilities unlike many other countries preparing similar budgets; the justification is that the budget is annual and that for any given year the deferral is equivalent to a reduction in the tax liability; the documents available describing the budget preparation do not mention whether late payments of tax liabilities authorized under this "incentive" scheme would be treated symmetrically, meaning that they would be included in the budget for the year they were actually paid as a "subsidy" to the government and entered as a negative item in that budget.

2. Summary Description of the Incentives SchemesIncentives to Regional Development

Objectives. The core of the regional incentives is provided by a set of programs aimed at the development of the North and the North-east. The exhaustive list of regions intended to benefit from incentives programs is provided hereafter. Regional incentives can be granted to projects leading to:

- (a) the creation of industrial or agricultural firms and the modernization or development of existing firms in the North region or North-east region;
- (b) the creation of industrial firms in the Zona Franca de Manaus in the Northern region; for those firms, the incentives come in addition to those granted through the North region program;
- (c) the development of western Amazonia;
- (d) the economic recovery of the state of Espirito Santo, the less developed state in the South of the country; and
- (e) the development of Grande Carajas.

Tax incentives. The incentives programs are specific to each region. They are of two main types. In the first case, they provide an investor with a reduction in his/her income tax liability due for activities elsewhere in the country. In the second, they provide the investor with a reduction for the tax liability arising from the project promoted by the incentive program. As was seen before, the principal tax break obtained is a total or partial reduction in the corporate income tax liability. Ten out of sixteen fiscal incentives programs are granted against the corporate income tax. But, within each region, these incentives can be cumulated with other regional or sector specific incentives. The major incentives for each regions are listed below. Some restrictions on the volume of tax reduction due to incentives apply. For instance, the entire amount of the corporate income tax liability which can be invested through incentive schemes is limited to 50% of such liability. If due to that limit a benefit cannot be taken in a particular year, it can be carried forward for up to 5 years.

SUDENE (North-East Development Authority) and SUDAM (Amazon Development Authority). For both regions, the incentives programs are the same. The first type of incentive works through the reduction of the total income tax liability of the firm investing in an incentive- endowed region. Since 1974, the two regions benefit from a financing allowed by the earmarking of a share -- 24%, including the share allocated to sectoral fund -- of the corporate income tax liability of businesses to two funds: FINAM (the Amazon Investment Fund), for the North (the Amazon), and FINOR (the North-East Investment Fund), for the North-East. The funds are deposited with special banks, administered and controlled by special agencies and finally invested in the purchase of shares issued by companies operating in the region concerned. The total share of the income tax liability which can be deposited to finance incentivated programs -- whatever their purpose -- is limited to a total of 50% of the total liability. The limit is reduced when combined with sectoral incentives granted for investments in agriculture in the North and North-east. The use of investment funds resources in a single project is also limited to 50% of the total investment programmed for new projects, 40% for the others. In exchange for their investment, tax payers receive securities, representing an interest in the relevant funds. Some of these shares have a stock market listing and quotation.

The second type of incentive consists in a reduction in the income tax liability arising from the project installed in the incentivated region. For projects initiated before December 31, 1988, a total exemption of income tax

liability for 10 years has been granted. Any imported machinery, equipment or foreign material required for the implementation of the project can obtain an exemption or rate reduction from the import tax and the IPI, if no Brazilian similar exist. In August 1988, the tax incentives to industrial and agricultural projects in SUDAM and SUDENE were extended to December 31, 1993.

In the Zona Franca de Manaus (ZFM), the benefits are added to those obtained through SUDAM. All sales to the rest of the country and all industrial products sales within the ZFM benefit from a full exemption from the IPI. In this case, the incentive benefits both the firm installed in Manaus and its customer using inputs produced in Manaus. The local producers can purchase equipment and raw materials exempt from the IPI and the import tax and sell their products with the same exemption. The distance between producers in Manaus and their major customers in the South is such that the major beneficiaries of the incentive program are products subject to very high IPI rates. Finally, Brazilian sellers of inputs to producers in Manaus also benefit from an IPI credit for taxes paid on inputs used in products sent to Manaus.

Tax preferences are also available for investments in the state of Espirito Santo, for Carajas, for the western Amazon and for a few Free Export Processing Zones. The tax incentives may take the form of tax holidays, exemption from indirect taxes or rate reductions. Since these programs are much less significant in terms of revenue losses for the government, they are not covered in this study.

Incentives to Sectors

Background. For three sectors -- tourism, fisheries and reforestation - the concession of tax preferences to sectors follows the structure used for regional incentives. Investment funds are made of parts of the corporate income tax paid by firms. The funds were managed by the Fiset (Fundo de Investimentos Setoriais). The firms created through the incentive program do not paid income tax and benefit from exemption or reductions from the IPI and the import tax on imports of parts, machinery and equipment. For many other sectors, the programs are specific as will be discussed below. Finally many of the programs have been removed for next fiscal year or are in the process of being removed. When known, their status will be specified in their presentation.

Objectives. Sectoral incentives have a very wide coverage. They cover aeronautics, agriculture, energy, fisheries, forestry, mining, ship building, steel, tourism and transportation in particular and include incentives that could equally apply to agriculture, industry or services depending on the particular circumstances of the firm. The objectives of these programs are also rather diversified. In some case, the incentives are used as an instrument for import promotion, in some others, they are based on the infant industry argument or they are simply used to fix some market failure which results in a socially "sub-optimal production" in a given activity. Often, sectoral incentives are also the result of intense lobbying by well organized producers association.

Tax Incentives. The sectoral incentive programs all have their very specific characteristics. Most (31 out of 64) of the sectoral incentives are granted against the IPI. Often also the IPI incentive is extended to the import tax or in the corporate income tax. The standard type of tax preference is the pure and simple exemption of the liability.

Tourism, Fishery and Reforestation. In addition to the two regional funds, the taxpayer could opt to allocate part of his corporate income tax liability to a sectoral investment fund (FISSET) which financed investment in Tourism, fisheries and reforestation. The creation of the sectoral investment funds lead to a competition for the same tax dollar obtained from the corporate income tax. The tax payer had the option of allocating it to the sectoral or regional funds. The activities financed by the FISSET funds included tourism, fisheries and reforestation. The first two options were suppressed in 1988. The third one will be suppressed in 1989. In addition a limit of 6% of the corporate income tax was imposed on the use of the remaining option. Under specific conditions, the tourism and fisheries continue to benefit from a total or partial exemption of their income tax liability.

Infrastructure. The sectors linked to the development of infrastructure, generally dominated by public enterprises, enjoy the major benefits. Firms producing or distributing electric energy (ELETROBRAS), firms in telecommunications (TELEBRAS) or firms involved in water cleaning benefit from a reduced corporate income tax rate. Currently, they pay 6% and are exempted of any surtax. Other firms producing public services and transport of passengers pay a rate of 17% and are also exempted from any surtax.

Agriculture. Firms engaging in agricultural activities are subject to a 6% income tax -- rather than 30% for most others. Individual farmers may take a deduction of up to 80% of their agricultural income the deduction is calculating by applying coefficients ranging from 1 to 6 to expenditures for farm improvement or contributions to the advancement of Brazilian agriculture. Individual farmers enjoy an additional incentive. Only 50% of net farming income (resulting once the deduction above has been taken, with a limit of 15% of gross receipts from farming, is included in taxable income. Furthermore, agricultural projects approved for SUDENE and SUDAM areas are eligible for the investment tax credit on new investment in these areas.

3. Incentives to Exports

An abundance of incentives were granted to promote exports since the mid-seventies. The discussion of incentives granted for the promotion of exports covers exports in general or specific exports. Some of these incentives are progressively phased out. But many remain in 1989, but in a milder form.

Capital goods imported by exporting companies in accordance with special export programs approved by CACEX or BEFIEX are fully or partially exempt from the import tax and the IPI. This incentive is expected to be in force up to 1991. Other incentives are available through BEFIEX. These include the allowance for an averaging of losses and profits over several years. A firm with a loss can include it in its operating costs for up to the next six years (against 3 years usually).

Components for the production of articles to be exported can be imported under the drawback regime provided the import duty involved is equal at least 5 minimum salaries and the value of exports exceeds at least 40% of the value of imports. The drawback may be implemented by means of tax deferral, exemption or reimbursement.

Until 1988, profits from export activities were exempt from the corporate income tax liability. In 1988, the tax rate became 3% and will be doubled each year after until exports profits are taxed at the same rate as profits from inward oriented activities.

Many incentives are also granted against the value added taxes. Exports of industrial products are exempt from the IPI. In addition, a tax credit for the tax paid on components of exported products is available to exporters. Exports of industrial product were exempt from the ICM, the states' value added tax, until this year. With the shift of the jurisdiction of the ICM to the states, some changes have been observed. Exports of semi-finished products will be subject to the states' value added tax.